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APPLE JUICE FROM SUPERCONCENTRATE IS PREFERRED

Consumer test in New York shows preference for one-plus-six glass pack type over single strength . . . . . .

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A PROCESS AND COST ESTIMATE for the commercial preparation of full-flavor superconcentrated apple juice has been published. Unlike the frozen concentrate (one plus three), the superconcentrate (one plus six) besides being convenient, offers savings in the cost of manufacture and requires only ordinary refrigeration for preservation. The fresh apple character possessed by juice reconstituted from the full-flavor superconcentrate is contributed by the aroma, which is first recovered as an essence and later restored to the concentrate, following procedures developed at the Eastern Regional Research Laboratory for various fruits. This fresh apple character has long been appreciated by trained tasters, but since the product had not yet been made available to the public no knowledge of their acceptance of it was available. This article describes a consumer test of the product in comparison with single-strength canned juice prepared in the conventional manner from the same blend of apples.

A blend of two parts Jonathan and one part each of McIntosh, Stayman-Winesap, and Northern Spy varieties was used. The quality was that commonly employed in commercial juice-making operations. After being sorted and washed, the apples were ground in a hammer mill, and the juice was expressed conventionally with a rack and frame press, then screened through a reel with a 200-mesh screen. The portion to be canned as single-strength juice was frozen for convenience in scheduling the work. Just before canning, it was thawed, and "clarified" by passage through a continuous supercentrifuge with a force 13,000 times gravity and a dwell of six minutes. The resulting juice would still be classified as cloudy. It had a Brix of 12.5 deg., a pH of 3.45 and an acidity of 0.54 per cent as malic acid. After heating in about 0.8 second to 185 deg. F., it was packed at this temperature into one-quart glass bottles. One and one-half minutes were required to fill each bottle. After the bottles were capped, they were inverted for one minute to sterlize the cap, then cooled. In our operations, there was no dwell of hot juice in the reservoir of the filler, as is the practice in commercial operations. This was compensated for by the slower filling time of the bottle. Thus the operations were arranged so that the time-temperature relations closely paralleled those of good commercial practice in hot packing single-strength juice.

The full-flavor superconcentrate was prepared by the procedures described in AIC-315, "High-Density, Full-Flavor Apple Juice Concentrate", except that vacuum concentration was carried out at 26½ in. instead of 28½ in. vacuum, as the higher vacuum has been shown to be unnecessary. Essence was restored to the concentrate, which was then stored in one-quart jars for three months at the recommended temperature of 35 deg. F. The single-strength juice was stored for an equal time at room temperature. Thus both products had equal storage histories at their respective temperatures of handling.

Consumer Evaluation Procedure

Through the cooperation of a large food manufacturer, the single-strength bottled juice and reconstituted juice from the full-flavor superconcentrate were evaluated by volunteer tasters in two New York department stores. One taste booth was located in the housewares department of a midtown Manhattan establishment, and the other in the basement of a store in the 14th Street district, also in Manhattan. The former provided about 67 per cent of the tasters. The samples were prepared out of the direct vision of the customers, who were consequently not influenced by the fact that one product was reconstituted from a concentrate. Both samples were served at within two deg. of 45 deg. F. Three ounces of each juice were served in marked paper cups, and the pitchers from which they were poured were in full view, so the difference in clarity was apparent to the taster. Tasters were asked which sample they preferred and why. If they expressed a preference based on appearance, they were then asked their preference based on flavor. Those expressing a preference on the basis of appearance were greatly in the minority. During one-half of the test, the control (single-strength juice) was placed on the taster's right and during the other half, on his left. A total of 375 persons tasted the juices, all but 12 of whom expressed a preference.

Among the 375 tasters, the preference ratio variant: control was 1.6. That is, for every person that preferred the single-strength juice, 1.6 persons preferred the juice made from the superconcentrate. In the opinion of a representative of the organization conducting the test, "This is a relatively high preference for this type of test and indicates a very real difference in acceptability." Twelve tasters expressed no opinion, and 24 expressed a preference based on appearance; thus among 339 tasters the preference was indicated to be based on flavor alone. In the group of 24 whose expressed preference was based on appearance, 100 per cent chose the juice reconstituted from the concentrate.

The recorded comments indicate that where the concentrate was preferred it was generally on some such basis as "more flavor", "better flavor", "more apple flavor", "more natural flavor". The preference of the minority for the canned juice was apparently influenced, to some extent, by its greater body (due to the presence of pectin and colloidally suspended material) and to the robust,

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somewhat earthy flavor that frequently characterizes cider as contrasted with purified apple juice.

It appears from this test, at least as far as the metropolitan New York area is concerned, that the public prefers the fresh apple flavor of juice reconstituted from a full-flavor superconcentrate to single-strength bottled juice. This preference is based very largely on flavor and does not take into consideration the advantages of a superconcentrate such as compactness and convenience in the refrigerator.

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